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Current Account Deficits in the Euro Area.
The End of the Feldstein Horioka Puzzle?

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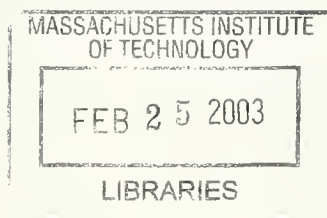# Current Account Deficits in the Euro Area. The End of the Feldstein Horioka Puzzle?

Olivier Blanchard and Francesco Giavazzi[*]

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In 2000–2001, the current account deficit of Portugal reached 10% of GDP, up from 2–3% at the start of the 1990s. Forecasts are for these deficits to continue in the 8–9% range for the indefinite future. Greece is not far behind. Its current account deficit in 2000-2001 was equal to 6-7% of GDP, up from 1–2% in the early 1990s, and again, the forecasts are for deficits to remain high, in the 5–6% range.

This is not the first time that some of the small member countries of the European Union run large current account deficits. In the early 1980s, Portugal for example ran deficits in excess of 10% of GDP. But these deficits had a very different flavor: Portugal then was still reeling from its 1975 revolution, from the loss of its colonies, and from the second oil shock; the government was running a large budget deficit, in excess of 16% of GDP. The

current account deficits were widely perceived as unsustainable, and indeed they turned out to be: Between 1980 and 1987, the escudo was devalued by 60%, and the current account deficit eliminated. In contrast, Portugal today is not suffering from large adverse shocks; the official budget deficit has been reduced since the early 1990s (although with some signs of relapse in 2002, as current estimates imply that Portugal may exceed the limits imposed by the Stability Pact), and financial markets show no sign of worry.

The fact that Portugal and Greece are each members of both the European Union and of the Euro area, and, in each case, the poorest members, suggests a natural explanation for these current account deficits. They are exactly what theory suggests can and should happen when countries become more closely linked in goods and financial markets. To the extent that they are the countries with higher rates of return, poor countries should see an increase in investment. And to the extent that they are the countries with higher growth prospects, they should also see a decrease in saving. Thus, on both counts, poor countries should run larger current account deficits. Symmetrically, richer countries should run larger current account surpluses.

The purpose of our paper is to see whether this hypothesis indeed fits the facts. We conclude that it does, with saving rather than investment as the main channel through which integration affects current account balances.

We proceed in four steps.

First, we use a workhorse open economy model to show how, for poorer countries, goods and financial market integration are likely to lead both to a decrease in saving and an increase in investment, and so, to a larger current account deficit. We also discuss how other, less direct, implications of the process of integration, such as domestic financial liberalization, are likely to reinforce the outcome.

Second, we look at the panel data evidence from the OECD since 1975. We document that the recent evolution of Portugal and Greece is indeed part of a more general evolution: The dispersion of current account positions has

steadily increased since the early 1990s. And current account positions have become increasingly related to the level of output per capita of the country. This evolution is visible within the OECD as a whole, but is stronger within the European Union, and stronger still within the Euro area. The channel appears to be primarily through a decrease in saving—typically private saving—rather than through an increase in investment.

Third, we return to the cases of Portugal and Greece. We conclude that the recent history of the two countries is largely consistent with the findings of the panel data regressions. Lower private saving—due to both internal and external financial market liberalization but also to future growth prospects—and, to a lesser extent, higher investment, appear to be the main drivers of the larger current account deficits.

We end by taking up two issues raised by our findings. First, we relate our results to the large body of research triggered by the "Feldstein–Horioka puzzle"—the finding of a high cross-country correlation between saving and investment. We show that, consistent with our findings, this correlation has substantially declined over time, especially within the Euro area. At least for this last group of countries, the Feldstein–Horioka fact appears to be largely gone. Second, we discuss whether the current attitude of benign neglect vis a vis the current account in Euro area countries is appropriate, or whether countries such as Portugal and Greece should worry and take measures to reduce their deficits. We conclude that, to a first order, they should not.

1   Current Account Balances and Economic Integration

A country that wants to borrow from the rest of the world must take into account two elements: the interest rate; and the price cuts it will need to make to generate sufficient export revenues to repay the debt in the future.

In this context, increased financial integration, i.e. either lower and/or

a flatter cost of borrowing, clearly makes it more attractive to borrow. In-
creased goods market integration, i.e. a more elastic demand for the coun-
try's goods, decreases future required price cuts and so has a similar effect.
Thus, in response to increased integration, borrower countries will want to
borrow more. And, by a symmetric argument, lender countries will want to
lend more. The distribution of current account balances will widen.[1] The
purpose of the model below is to formalize this argument. The model is
straightforward; but it will be useful in organizing the empirical work and
discussing some of the policy and welfare issues later on.[2]

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[1] A classic example of the effects of economic and monetary integration is that of Puerto
Rico's integration with the rest of the United States in the early postwar period. An
equally classic analysis of what happened—an analysis made feasible by the fact that
statistics on flows continued to be collected even after integration—can be found in Ingram
[1962]. Between the early 1950s and the second part of decade, as a result of increased
financial integration between the island and the rest of the United States, net private
capital inflows into Puerto Rico from the rest of the U.S. jumped from 3 to 11% of Puerto
Rico's GDP per year. One half of these inflows came in the form of direct investment, one
half in the form of long–term borrowing by local banks; both of these sources of external
financing had been virtually non-existent up to the mid–50s. Investment increased from
16 to 20% of GDP. The current account deficit between Puerto Rico and the rest of the
United States. widened even more, reaching, by 1958, a stable level of 12 per cent of
GDP per year, and reflecting not only an increase in investment, but also a decrease in
saving. In a later essay, Ingram [1973] used the experience of Puerto Rico to suggest that
a European monetary union would free member states from the link between national
saving and investment. Our paper can be seen as checking Ingram's hypothesis.

[2] An early model of the evolution of the current account along these lines was developed
by Fischer and Frenkel [1974]. An overlapping generation version was later analyzed by
Dornbusch [1983].

Think of a group of n countries trading goods and assets among themselves (for convenience, we shall sometimes refer to this group of countries as the "world" but what we have in mind is the set of countries in the trading group).

Each country produces its own good, but households in each country consume the same composite good.

Households live for two periods and maximize:

$$\log(C_t) + \log(C_{t+1})$$

where:

$$C \equiv (\frac{1}{n} \sum_{i=1}^{n} C_i^{(\sigma-1)/\sigma})^{\sigma/(\sigma-1)}$$

and their intertemporal budget constraint is given by:

$$C_t + ((1+x)R)^{-1}C_{t+1} = P_t Y_t + ((1+x)R)^{-1}P_{t+1}Y_{t+1}$$

P is the price of the good produced by the country. in terms of consumption. R is the interest rate in terms of the composite consumption good, the consumption interest rate for short.

The parameter σ is the elasticity of substitution among goods, and, to satisfy the Marshall–Lerner condition, is assumed to be greater than one. The parameter x is a wedge between the world consumption interest rate and the rate at which a country can borrow (We are considering here a borrower country).

For the time being, we take production as exogenous. Thus, movements in the current account reflect only saving decisions.

With logarithmic preferences, consumption spending in the current pe-

riod is given by:

$$C_t = \frac{1}{2}(P_t Y_t + \frac{1}{R(1+x)} P_{t+1} Y_{t+1})$$

Define *ca* as the ratio of the current account balance to national income. Then, *ca* is given by:

$$ca_t = \frac{1}{2}(1 - [\,\frac{Y_{+1}}{Y_t}\frac{1}{R(1+x)}\frac{P_{+1}}{P_t}\,])$$

The three terms in the expression in brackets on the right give the determinants of the current account balance:

- Output growth. The first term is equal to one plus the rate of growth of domestic output. The higher output is next period relative to this period, the larger the current account deficit.

- The interest rate. The second term gives the effect of the interest rate faced by the country. The higher the consumption interest rate, or the higher the wedge, the more expensive it is to borrow, the lower the current account deficit.

- The rate of change in the terms of trade. The third term is equal to one plus the rate of change of the price of the domestic good in terms of consumption. The larger the fall in the price of the domestic good required next period to sell domestic goods and repay the debt, the more expensive it is to borrow, the lower the current account deficit.

The expression above provides the right starting point to show the effect of integration on the current account balance of a country that, like Portugal and Greece, is poorer than its trading partners, but catching up. Assume that *n* is large, so we can ignore the contribution of the country we are

looking at to world variables.[3] Assume also that all other countries are fully integrated, thus facing the same interest rate R (with no wedge).

Under these assumptions, sum the first-order conditions for the consumer's problem $(1/C_t = R(1/C_{t+1}))$ over countries. Use the fact that aggregate consumption is equal to aggregate income, to get:

$$R^{-1} = Y_t^* / Y_{t+1}^* = 1/(1 + g^*)$$

where Y^* is the average world level of output, and g^* is the world rate of output growth.

Noting that the demand for the good produced in a given country is given by:

$$P_t = (Y_t / Y_t^*)^{-1/\sigma}$$

and correspondingly for P_{t+1}, we can express the current account as:

$$ca_t = \frac{1}{2}(1 - \frac{1}{1+x}(\frac{1+g}{1+g^*})^{1-1/\sigma})$$

So, if output growth in the country we are considering exceeds the output growth of its trading partners, and the borrowing wedge x is not too large, the country will run a current account deficit.

Using this expression, we can now return to the effects of integration on the current account balance. For countries such as Greece and Portugal, economic integration has had three main dimensions: the Single European Market, which mostly affected the product market; the integration of finan-

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[3]This assumption is easily relaxed—at some cost in the algebra. Relaxing it introduces an additional effect, the dependence of the slope of the supply of funds on n, the number of trading partners: The larger n, the smaller the effect of borrowing by the country on the equilibrium consumption interest rate, so the flatter the supply of funds to the country. This provides another dimension of integration, namely as an increase in n.

cial markets within the European Union; and finally, monetary union, with the adoption of the Euro in the late 1990s. All three channels have clearly worked in the direction of potentially widening the current account deficits of these countries:

- Since the early 1990s, the single European market has led to an increase in σ, the elasticity of demand facing domestic goods within the European Union:

  Beyond the elimination of tariffs and a sharper enforcement of competition rules across the European Union, factors such as the harmonization of safety requirements for products, the extension of distribution networks, have led to goods being closer substitutes (either in product or geographic space), and thus to a higher elasticity of demand for each good.[4]

  As a result, goods market integration has reduced the adverse terms of trade effect a country faces when it needs to generate a current account surplus to repay the debt: this has made borrowing more attractive. Going back to the expression above for the current account, assume that the country we are looking at has a higher growth rate than its trading partners, so it is running a current account deficit. Then, the higher σ, the larger the size of the deficit.

- Financial integration has led to a decrease in the wedge x within the European Union.

  Beyond the elimination of capital controls and other explicit barriers to financial flows, the harmonization of financial market rules has reduced

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[4]In our specification, σ was formally introduced as a taste parameter. Think instead of our specification of utility as a reduced form reflecting the higher substitutability of products, for whatever reason.

regulatory uncertainty faced by foreign lenders, and has improved the transparency of information on potential borrowers:

Thanks to the "single passport" legislation (the 1993 EU Investment Services Directive which addressed the cross-border activities of all types of financial firms), an EU bank that wishes to do business in another member state no longer needs to set up a full subsidiary and be subject to local regulation and supervision: It can do business there opening a branch, or, even more simply, operating directly from its home base where all the key aspects of its solvency, liquidity, and risk are supervised by its home regulator. In parallel, the harmonization of firms' reporting requirements has improved information and decreased the risk faced by foreign lenders.

Also, as emphasized by Gourinchas and Jeanne [2002], by increasing the cost of expropriation of foreign lenders and investors, financial integration has also decreased the risk of expropriation and thus the risk premium they required.

• Monetary union has led to a further decrease in x within the Euro area.

Monetary union has eliminated currency risk. While foreign exchange risk among EMS countries certainly diminished after the currency realignments of the early 1990s—as these realignments eliminated the most obvious cases of overvaluation—the cost incurred by some investors and financial institutions during the ERM crises of 1992-93 remained in the memory of market participants. This lingering uncertainty was only really eliminated in the late 1990s, as adoption of the Euro became a near certainty.

Elimination of currency risk increases the relative importance of other elements of risk: Credit risk has become the most important component of the pricing of a security within the Euro area, with the

implication that the relative quality of underlying credits, rather than judgments about the stability and volatility of the currency, drives securities prices. All of this obviously makes the "national" dimension of capital flows increasingly fuzzy.

Monetary union has also led to larger and deeper markets for specific financial instruments, such as the market for Euro bonds; we shall see examples of this when we return to the cases of Portugal and Greece later.

So far we have focused only on saving, but it is straightforward to introduce investment and build on this simple structure. The results can easily be summarized in words:

- Allow production to depend on capital, and take a country which is poorer in the sense of having less capital, and thus a higher marginal product of capital than the others. How much investment will take place will depend on both the cost of borrowing, and on the evolution of the terms of trade: the lower the relative price of domestic goods in the future, the less attractive it is to invest in the production of domestic goods.

  Then, very much for the same reasons economic integration is likely to lead to a decrease in saving, it is likely to lead to an increase in investment. Rather obviously, to the extent that financial integration leads to a lower cost of finance, investment will increase. And to the extent that goods market integration leads to an increase in the elasticity of demand for domestic goods, investment will also increase: The higher the elasticity of demand, the smaller the decrease in price needed to sell the additional output in the future, and so the more attractive investment this period.

- To the extent that investment increases, this will lead, both directly

and indirectly, to a larger current account deficit than was the case in our model above. Directly, as the increase in investment is only partly offset by an increase in saving. Indirectly, to the extent that higher investment leads to higher expected growth, (an increase in g relative to g^*), higher real income in the future, and so lower saving this period.

- Poorer countries are poorer not only because they have lower capital, but also because they have lower total factor productivity. Again, the evidence is that both goods and financial market integration are likely to lead, in particular through higher competition, to an increase in total factor productivity.[5] To the extent that this is the case, this is likely to improve growth prospects in poorer countries, and lead to a further decrease in saving.

- Financial integration often comes, at least in part, with domestic financial liberalization. New instruments, for example more flexible mortgages, may be introduced. To the extent that this is the case, and that domestic financial liberalization leads to lower saving, the effect on integration on the current account will be reinforced.

To summarize: Both financial and goods market integration are likely to lead, in the poorer countries, to both a decrease in saving and an increase in investment, and so to a deterioriation of the current balance. How much of the adjustment takes place through lower saving, how much through higher investment depends, among other factors, on the relative roles of capital and TFP in explaining differences in income per capita across countries, and the relative roles of financial integration and financial liberalization.

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[5]See for example the findings of a recent McKinsey report on France, Germany, and the United States in the 1990s (McKinsey Global Institute [2002]).

2 The Widening of Current Account Balances. Panel Data Evidence

Having laid down a simple frame, we now return to the data, not only for Portugal and Greece but for the OECD in general, and the European Union and the Euro area in particular.

To organize the discussion, we typically present results for four groups of countries:

- "OECD minus", i.e all OECD countries except Mexico, Turkey, Korea, Central European countries (The Czech Republic, Slovakia, Hungary, and Poland), and Luxembourg—22 countries in all. The reasons for removing those countries vary. The mechanisms behind the evolution of current account deficits in Mexico, Turkey, and Korea, three much poorer countries, are likely to be different from those in the richer OECD countries. Data for Central European countries only exist from 1990 on, so the countries cannot be used when constructing a balanced panel (we shall briefly report the results from unbalanced panel regressions below). And the economy of Luxembourg is highly idiosyncratic; in particular, Luxembourg reports consistent current account surpluses of the order of 30% of GDP.

- "European Union", or EU for short, the group of European Union countries, again excluding Luxembourg—so 14 countries in all. The rationale for looking at this subgroup of OECD countries is obvious. If integration is the basic force behind the widening of current account balances, one would expect the effect of the Single Market to be much stronger for EU countries than for OECD countries in general.

- "Euro area", or Euro for short, the countries now in the Euro area, minus Luxembourg, so 11 countries in all. (Greece, which joined in 2001, is included throughout). The rationale for looking at this group

is equally obvious. With the fixing of parities in 1999, and the shift to the Euro at the end of the 1990s, one would again expect the degree of integration to be stronger for Euro countries than for EU or a fortiori OECD countries in general.

- "Euro minus", the set of countries in the Euro area, minus Portugal and Greece, 9 countries in all. The reason for looking at this subgroup is simply to see whether the results for the Euro area are due to these two countries or hold even in the rest of the Euro area.

To start, Figure 1 reports the standard deviations of the cross–country distribution of the ratio of current account balances to GDP for each year. For current account balances—and, later, saving and investment—we use data from the European Commission database, called AMECO (which stands for "Annual Macroeconomic Database of DG Ecfin"). These are based on national income accounts and, post 1995, on the ESA95 EU accounting system. The numbers are not always equal to those published by the OECD, which appear sometimes based on other sources (for example the OECD current account data for Greece are based on Bank of Greece data, which are constructed using bank settlement data rather than trade data). The differences can be non negligible: In 2000, the current account deficit of Greece was 4.5% according to the EU, 7% according to the OECD. But the differences are mostly level differences, and the conclusions below are roughly unaffected by which series we use.[6]

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[6] A larger issue is whether we should look at the current account balance or the change in the net foreign asset position of the country—which, in principle, includes revaluations of assets and liabilities. Because of the measurement issues associated with available series for changes in net foreign assets, we prefer to use the series for the current account balance. For the set of countries we look at, the general evolutions we describe below are robust to
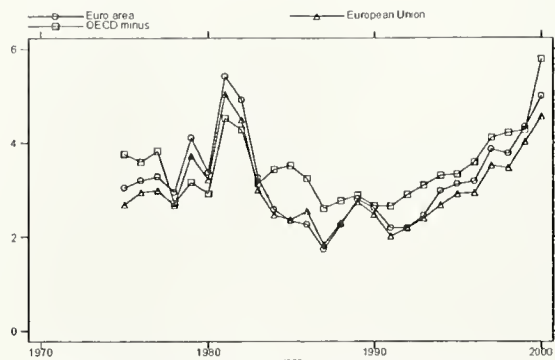
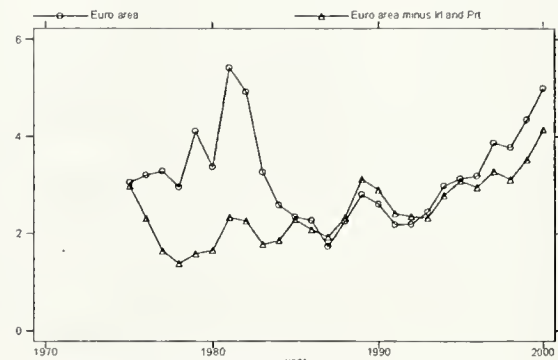Figure 1a. Standard Deviations, OECD, EU and EURO, 1975--2000

Figure 1b. SDs. EURO and EURO except PRT, IRL, 1975--2000

Figure 1a reports results for each of the first three groups described above. The time series have three characteristics:

- The results are similar across the three groups; indeed, there is no evidence of stronger widening of balances for either the Euro area or the EU than for the OECD as a whole.

- There is a sharp but temporary increase in the standard deviation in the early 1980s.

- There is a steady increase in the standard deviation since the late 1980s, leading to a more than doubling of the standard deviation over the last 15 years.

A further look at the data suggests a sharp difference between the short lived increase of the early 1980s and the steady increase later on. The increase of the early 1980s is entirely due to large deficits in just two countries. The first is Portugal. We briefly discussed the episode in the introduction, a period of very large unsustainable deficits, due to the aftermath of the revolution, the loss of colonies, the second oil shock, and a loss of control of fiscal policy. The second is Ireland, where the combination of the oil shock and a fiscal expansion (with fiscal deficits exceeding 12% of GDP) also led to very large and unsustainable current account deficits. The point that nearly all of the action in the early 1980s comes from these two countries is shown in Figure 1b, which plots the standard deviation for Euro countries, with and without Portugal and Ireland. When the two countries are left out, the peak of the early 1980s is fully gone, and the standard deviation rises more or less steadily from the early 1980s on, with a sharper increase in the 1990s.

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whether one uses current account balances or changes in net foreign asset positions. For more on the relation between the two series, see Lane and Milesi-Ferretti [2001a].

The next step is to try to explain which countries have been running larger deficits, and which countries have been running larger surpluses. Basic growth theory, and the open economy model presented in the previous section, suggest exploring the relation between the level of output per capita and the current account balance. Countries that are poorer have more potential for catch–up, either through capital accumulation, or technological progress (for empirical evidence on convergence within the OECD, see for example Barro and Sala-i-Martin [1992]). Economic integration makes it easier for these countries to borrow, and thus to run larger current account deficits.

We take a first pass at the data in Figure 2. The figure is a set of scatterplots of the time average of the ratio of the current account deficit to GDP against the time average of output per capita, for two subperiods, 1985-1994 and 1995-2001, for different group of countries. Output per capita is constructed as PPP GDP per capita in 1985 dollars, using the data from Heston and Summers up to 1992, and extrapolated using real GDP growth rates thereafter. The choice of 1985 as a starting date is to avoid the episode of the early 1980s we saw earlier. The first two panels give scatterplots and the regression line for OECD minus, the second two for EU, and the third two for EURO. The regressions results for the six panels are given by:
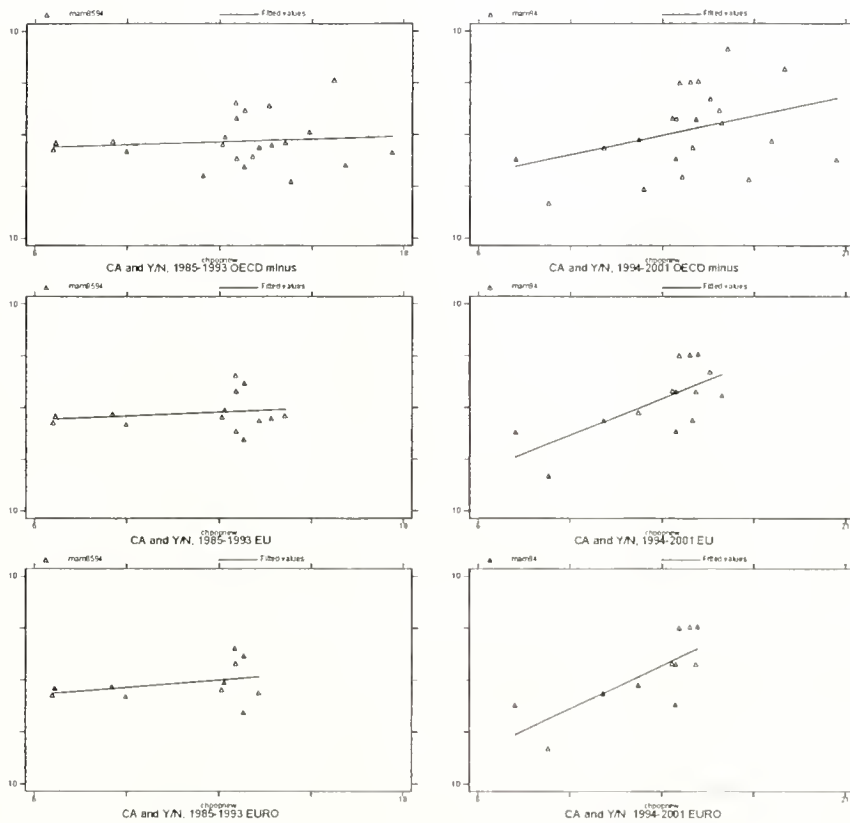
Figure2. CA and Y/N

OECD minus

1985-1994	CA/GDP	=	−1.8	+	0.09 Y/N		
					$(t = 1.5)$	$R^2 = 0.01$	
1994-2001	CA/GDP	=	−6.8	+	0.49 Y/N		
					$(t = 5.2)$	$R^2 = 0.13$	

EU

1985-1994	CA/GDP	=	−1.9	+	0.12 Y/N		
					$(t = 2.0)$	$R^2 = 0.03$	
1994-2001	CA/GDP	=	−11.8	+	0.94 Y/N		
					$(t = 10.2)$	$R^2 = 0.48$	

EURO

1985-1994	CA/GDP	=	−2.8	+	0.23 Y/N		
					$(t = 3.4)$	$R^2 = 0.10$	
1994-2001	CA/GDP	=	−13.5	+	1.10 Y/N		
					$(t = 11.0)$	$R^2 = 0.58$	

The figure and associated regressions have two striking features:

- There is a substantial strengthening of the relation between the current account and output per capita from the first to the second subsample. Except for the Euro area, the coefficient is typically insignificant for 1985-1994; it becomes much larger and very significant in 1995-2001.

- The increase is stronger for the EU than for the OECD as a whole, and stronger for the Euro area than for the EU (although the difference between EU and the Euro area is neither statistically or economically significant).

Both features are very much consistent with the idea that integration is an important factor behind current account evolutions. Integration was higher to start with within the EU or the Euro area, and has continued at a higher pace. To look at the relation further, we run the following

specification:

$$(\text{CA/Y})_{it} = a_t + b_t \, (\frac{\text{Y/N}_{it}}{\text{Y/N}_t}) + X_{it}\beta + \epsilon_{it}$$

The specification is largely standard (for recent surveys and extensions
of the literature of the determinants of current accounts, see for example
Debelle and Faruqee [1996] or Chinn and Prasad [2000].): The ratio of
the current account balance to output in year t for country i depends on a
common time effect, on the level of income per capita in year t for country
i relative to the average level of income per capita in year t for the group
of countries we are looking at, and on other control variables included in
the vector X_{it}. The only non standard aspect of the specification, and the
one central to our exploration here, is that we allow the effect of the level
of income per capita, to vary from year to year.

In our basic specification, we use two controls (in addition to the time
effects). The first is the dependency ratio, constructed as the ratio of pop-
ulation to the labor force: Other things equal, we expect a country with a
relatively higher dependency ratio to save less. The second is the rate of
growth of output from year $t-1$ to t, to capture cyclical effects of move-
ments in output on the current account. The theory we saw earlier suggests
that integration may also affect the elasticity of the current account with
respect to cyclical movements; for this reason, we also allow the effect of
output growth to vary from year to year. (The results are nearly identical
if we use the measure of the output gap constructed by the OECD, a mea-
sure which aims at capturing cyclical movements in output). The period of
estimation runs from 1975 to 2001. The starting year is constrained by the
availability of comparable data on saving, which we use when we analyze
the components of the current account separately below.

The simplest way to present our results is by plotting the set of estimated
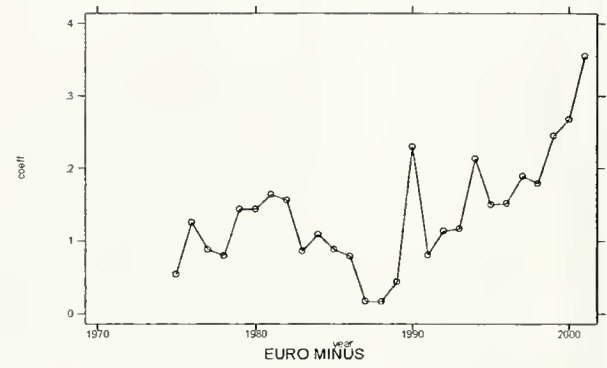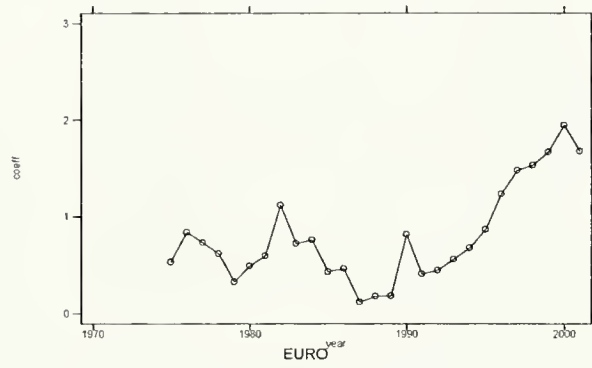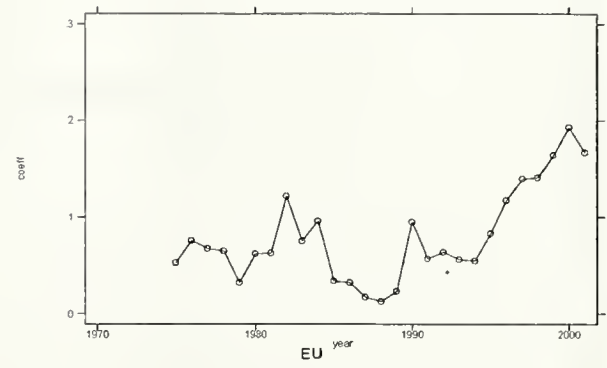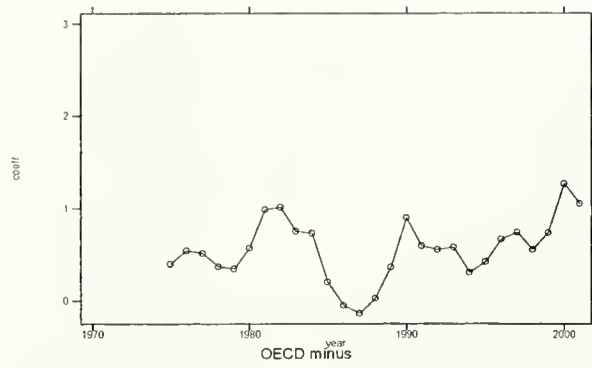coefficients b_t against time. This is done in the four panels of Figure 3.

Figure 3.Effect of Y/N on CA, by year, 1975-2000

- Figure 3a shows the results for OECD minus. The coefficient is nearly always positive, but there is no obvious trend. In other words, the widening of current account balances does not appear to reflect an increased dependence of the current account on the level of income.

- Figure 3b does the same for the EU. There, the evolution of the estimated coefficients resembles the evolution of the standard deviation earlier. The high deficits of the early 1980s in both Portugal and Ireland, two relatively poor countries leads to a temporary increase in the coefficient. And one also sees the steady increase in the coefficient from the late 1980s on. By the mid–1990s, the coefficient is both statistically and economically significant. For example, the estimated coefficient of 0.2 in 2000 implies, that, other things equal, for a country with an income per capita 40% below the average EU level (which is roughly the case for Portugal and Greece), the ratio of the current account balance to GDP should be 8 percentage points lower than the EU average. (In 2000–2001, the current account for the EU was exactly balanced. The deficit for Portugal was, as we have seen, roughly 10% of GDP).

- Figure 3c does the same for EURO. The coefficients look very much the same as for the EU; this is not a great surprise, given that the large overlap between the two groups of countries. Figure 3d finally shows the results for the EURO minus, to check the influence of Portugal and Greece. The increase is actually larger in the 1990s when Portugal and Greece are left out, with the coefficient reaching 0.35 in 2001.

In short, Figure 3 suggests that, for the EU, the widening of current account positions can be largely accounted for by an increased dependence on output per capita. The effect seems weaker, if present at all, for the OECD. And there is no strong evidence of an additional Euro effect.

How robust are these results? We have explored a number of alternative specifications:

- Income per capita may be a poor proxy for what we are trying to capture. While convergence of income per capita appears to hold for the set of countries we are looking at, some of the poorer countries may have a bleak future. Some rich countries may be appealing to foreign investors, for reasons having to do both with expected return and with risk characteristics; think for example of the United States, and its long string of current account deficits. (This theme has been explored, both theoretical and empirically, by Ventura [2002] and Lane and Milesi-Ferretti [2001b].)

This suggests replacing output per capita in our regressions by the initial net asset position of the country, and again interact its coefficient with time.[7] Presumably, if a country has been borrowing steadily in the past, so its asset position is negative, it has characteristics which are attractive to foreign investors. Further financial and economic integration are then likely to allow for more foreign inflows, and thus larger current account deficits.

Figure 4 shows the set of estimated coefficients from a regression using foreign assets per capita in 1990 (rather than income per capita). The variable for net foreign assets comes from Lane and Milesi-Ferretti [2001a] and is measured in millions of dollars. (Regressions using either foreign assets per capita in 1980, or foreign assets per capita for each year, give very similar results.) Because the level of foreign assets can be positive or negative, we cannot use the same normalization as for income per capita; we use instead the difference between the level of

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[7]For more on the relation between foreign asset positions and income per capita, see Lane and Milesi-Ferretti [2001a].
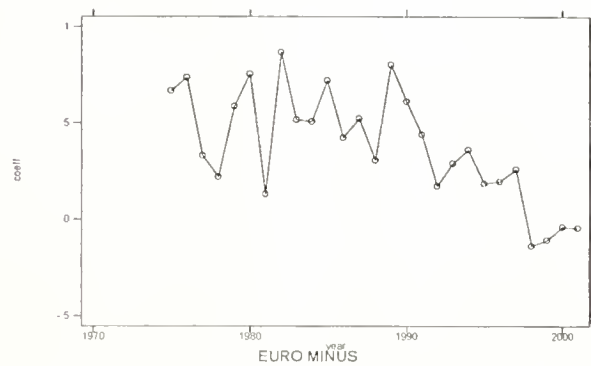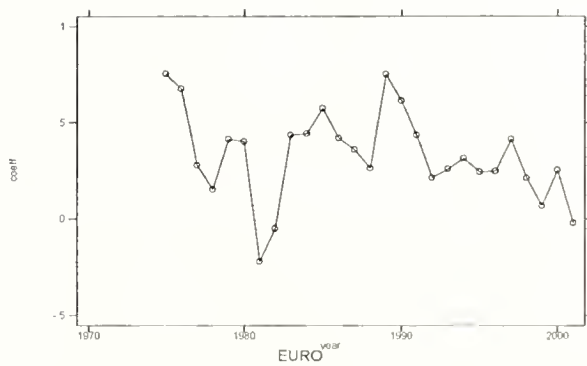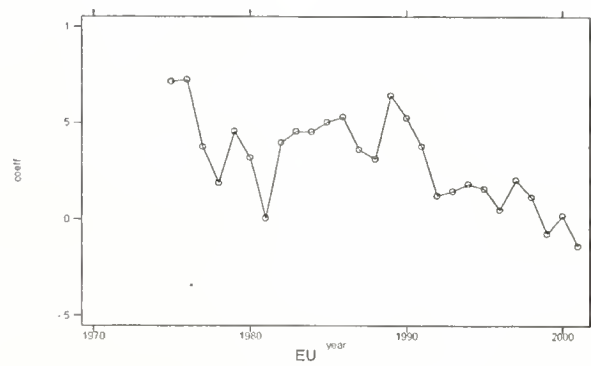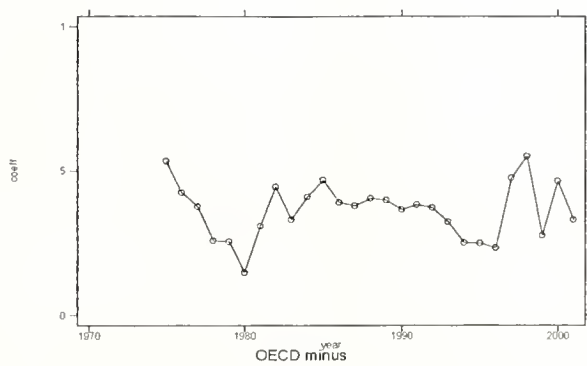
Figure 4. Effect of Asset position on CA, by year, 1975-2000

foreign assets for country i in year t and the average level across the relevant group of countries in year t. The main conclusions we draw from the four panels are two:

The coefficients are typically positive: Countries which have borrowed in the past tend to run current account deficits. This conclusion has been well documented by others. But there is no evidence of a stronger relation between the financial asset position and the current account balance. For the OECD minus, the coefficients are typically significant, but show no trend. And for the EU and the EURO, the trend is clearly the other way, with a steady decrease in the coefficient over time.

- The current account reflects not only the behavior of private saving and investment, but also of public saving. Unless Ricardian equivalence holds, public saving is likely to affect total saving, and thus the current account. And one of the main evolutions of the 1990s has been, as a result of Maastricht, a strong improvement in the fiscal position of most European Union countries.

With this motivation, we have explored a specification adding another control variable to the basic specification, the ratio of structural primary balances (as constructed by the OECD) to GDP for each year and each country. The results are easy to summarize. For all four groups of countries, the coefficient on the fiscal variable is tightly estimated, and very significant. For the OECD as a whole, an increase in the structural primary balance of 1% of GDP leads to an improvement in the current account of 0.2%. The estimates are nearly identical for the EU and the EURO. But the time series of estimated coefficients on output per capita is nearly identical to that in Figure 3 (and so, we do not report them here). In other words, the increased widening does not appear to come from diverging evolutions of public saving across countries.

- Accession countries, that is the countries from Central and Eastern Europe which are candidates to join the EU, should provide an excellent test of our hypothesis: They are poorer that the current EU members, expect to grow fast after joining the EU and, in preparation to entry, have undergone some internal liberalization and have started to remove some barriers to economic integration. The problem with these countries is the availability of data, which do not start until the early 1990s. When we include them in the regressions reported above, re–run over much shorter samples, the results tend to confirm those presented above. This is hardly surprisingly, since most accession countries have ran large current account deficits in the 1990s (the average ratio of the current account balance to GDP for the period 1993-2001 was –3.6% for the Czech Republic, –4.9% for Hungary, –3.6% for Poland, and - 9% for the Slovak Republic).

We finally turn to whether the increased dependence of current account balances on output per capita reflects an increased dependence of saving, or an increased dependence of investment.

To do so, we simply run the basic specification, replacing the ratio of the current account to GDP first by the ratio of saving to GDP, and then by the ratio of investment to GDP.

The four panels of Figure 5 show the results of the saving regression. We draw two conclusions:

- For the OECD as a whole, there is not much evidence of a significant effect of output per capita on saving, and no evidence of a trend. Saving appears unrelated to the level of income per capita. The coefficient tends to be negative (lower output per capita leading to lower saving) for most of the 1980s, close to zero for most of the 1990s, and the value for 2001 is roughly equal to the value for 1975.

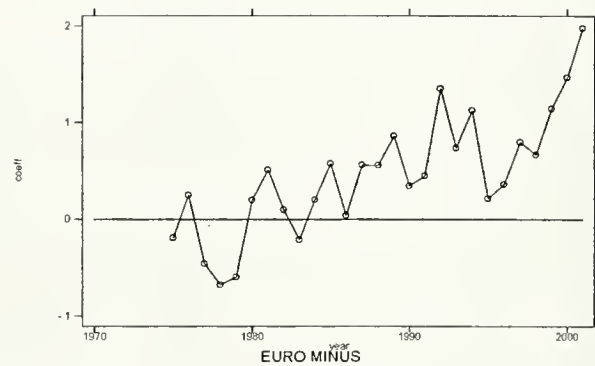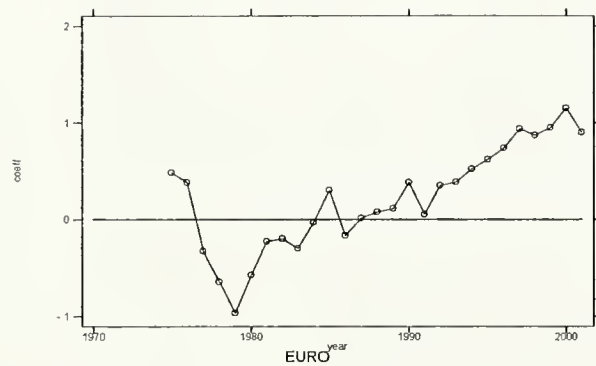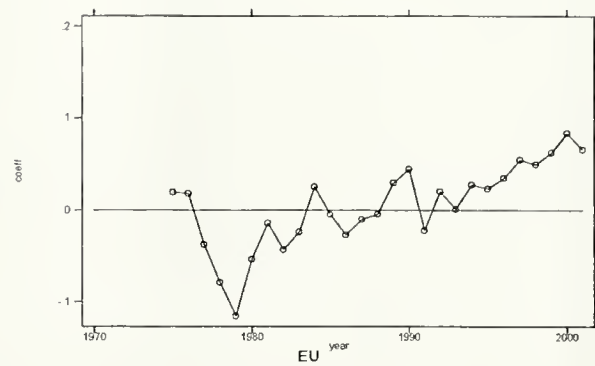- For both the EU and the Euro area, there is much clearer evidence
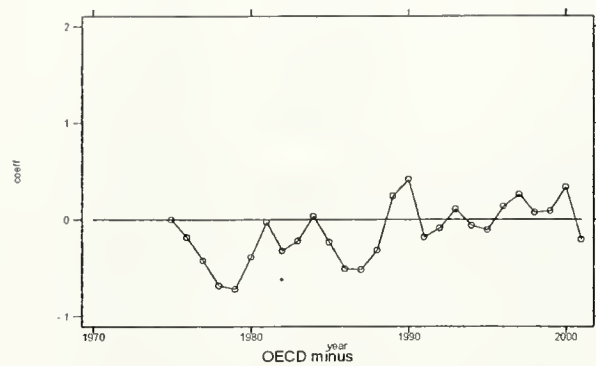
Figure 5.Effect of Y/N on saving, by year, 1975-2000

of a trend. After a sharp decline in the 1970s, the coefficient steadily increases over time, both in the 1980s and the 1990s. Interestingly, the coefficient changes sign: At the start of the sample, saving is negatively related to income per capita—a sign opposite to that predicted by the standard open economy growth model. It turns positive in the late 1980s, turning larger in the Euro area than in the EU. Integration per se does not easily explain the change in sign, and this suggests the presence of other factors at work, such as financial development or financial liberalization: Poorer countries have introduced new financial instruments and institutions, which have led to a decrease in saving. This, combined with integration, has led to larger current account deficits.

The four panels of Figure 6 show the results of the same exercise, this time for investment. They suggest two conclusions.

- The coefficient is typically negative: A lower income per capita is associated with higher investment, the sign predicted by the standard model.

- There is however no evidence of a trend, of a more negative effect of income per capita on investment over time (There is a steady decrease in the coefficient starting in the mid-1990s, but this is too small and too recent to qualify as a trend). In short, the increased dependence of current account balances on income per capita reflects, for the most part, an effect through saving than an effect through investment.

The importance of the effect through saving suggests the relevance of trying to separate the effects of integration and internal financial liberalization. With this in mind, we have explored the effects of introducing as an additional control the ratio of $M3$ to GDP, a ratio which is often taken as a proxy for the stock of debt instruments available to firms and households,
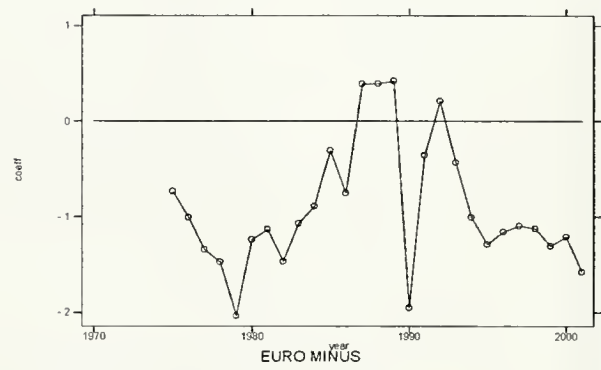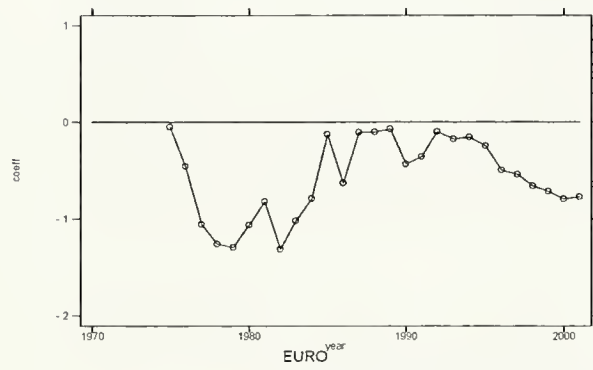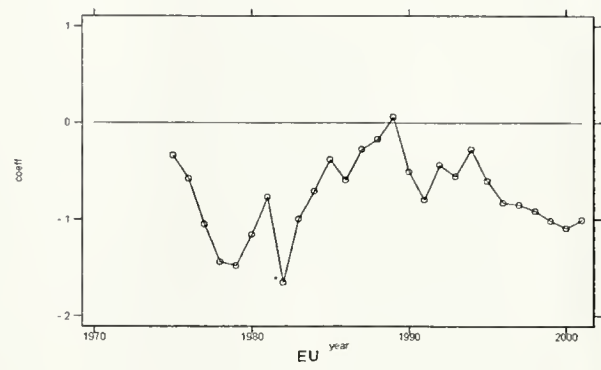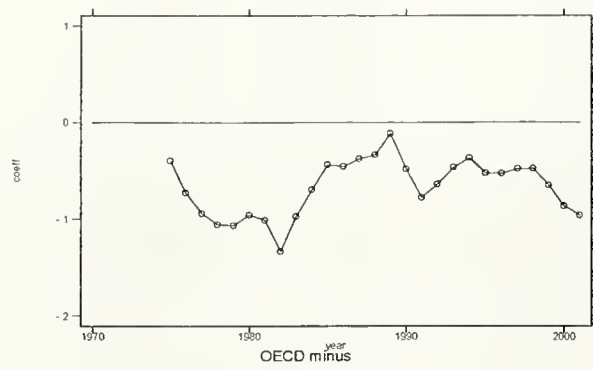
Figure 6. Effect of Y/N on investment, by year, 1975-2000

and thus as a proxy for financial deepening (see for exampleKing and Levine [1993] for a use of this ratio as a measure of financial development in standard growth regressions). The results show that current account balances are strongly negatively related to the ratio of $M3$ to GDP, suggesting that internal financial liberalization does play an independent role in determining the cross-country distribution of current account balances. The effect is both statistically and economically significant: An increase in the ratio of $M3$ to GDP of 30 percentage points (as was, for example, the case in Greece in the 1990s) is estimated to lead to a decrease in the ratio of the current account to GDP of about 1.2 percentage points. But introducing this additional control does not significantly affect the coefficients on relative income per capita.

Panel data regressions only go so far, and one often has a better sense of the underlying mechanisms by looking at individual countries. This is what we do in the next section, where we return to the experience of Portugal and Greece.

3   Back to Portugal and Greece

3.1   Portugal

Figure 7 shows the evolution of Portuguese investment and saving, as ratios to GDP, from 1985 to 2001. It clearly shows the steadily increasing divergence between investment and saving, and the resulting steadily increasing current account deficit, starting in the 1980s.

In trying to assess how much of the change in the current account deficit is due to a change in saving or to a change in investment, one must be careful in the choice of a base period. The early 1990s was a period of low growth for cyclical reasons, and so is not the right base period. Thus, in presenting numbers in Table 1, we divide time in three subperiods: 1985–1991 (1985 is the first year post–stabilization, following the large fiscal and

current account deficits we discussed earlier, 1991 is the last year of sustained growth), a period with an average growth rate of 5.1%; 1992–1995, a period of low growth and so unusually low investment and saving, a period with an average growth rate of 1.5%; and 1996–2001, a period of sustained growth, with an average growth rate of 3.5%. Finally, to show recent evolutions, we also present numbers for 2000 and 2001, years with growth rates of 3.3% and 1.9% respectively. In reporting changes in the last column, we report the difference between the numbers for 2000–2001 and the numbers for 1985–1991, the period we take as the base period.

Table 1. Current Account Balance, Investment, and Saving, as ratios to GDP, percent. Portugal 1985-2001

	1985-1991	1992-1995	1996-2001	2000-2001	Δ
Current account	0.6	-2.0	-7.0	-10.0	**-10.6**
Investment	25.3	22.8	26.6	28.1	**-2.8**
Saving	25.9	20.8	19.5	18.1	**-7.8**
of which					
Public saving	4.6	2.3	2.6	2.4	**-2.2**
Private saving	21.3	18.5	16.9	15.7	**-5.6**
of which					
Household saving	9.2	8.3	5.7	5.4	**-3.8**
Corporate saving	12.1	10.2	11.2	10.3	**-1.8**

Δ: *Difference between 2001–2000 and 1985–1991. Source: European Commission, Statistical Annex of European Economy, Spring 2002. The breakdown of private saving comes from the Direccao General de Estudos e Previsao.*

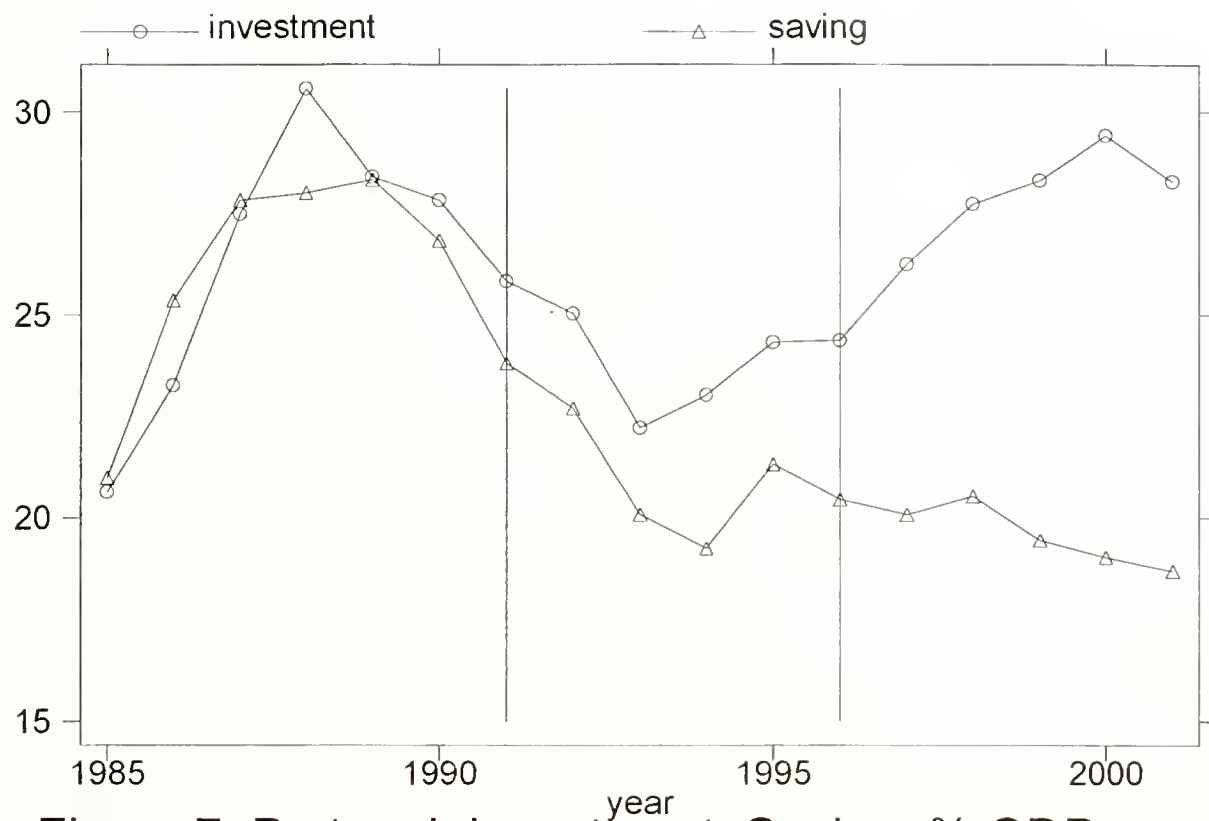The numbers in Table 1 for public and private saving, and for household

Figure 7. Portugal: Investment, Saving. % GDP

saving, are adjusted for inflation. More specifically, based on information about the composition of debt by currency denomination, we add to the official number for public saving an amount equal to inflation times the proportion of the public debt denominated in domestic currency times the debt. (The adjustment matters very much, as inflation has decreased from an average 14% over 1985–199 to 7% over 1992–1996, and to 3.5% since; the average ratio of public debt denominated in domestic currency has remained stable around 50%). We subtract a similar amount from private saving, and so leave unchanged the official number for the current account. This amounts to the assumption that the public debt is held domestically; in the absence of series on domestic and foreign holdings of public debt, there is no obviously better feasible adjustment.[8]

How to allocate the inflation adjustment of private saving between household versus corporate saving is much more difficult.[9] It depends for example on whether government bonds are held by households or financial intermediaries, and in the second case, on the type of liabilities issued by these intermediaries. Further adjustments should also be done for nominal corporate bonds and other nominal liabilities, and, on the other side, for mortgages and other household nominal liabilities. We could not obtain sufficient data to do these adjustments.[10] Thus, we use a simple rule: We subtract the full inflation adjustment on government debt from household saving: This

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[8]Estimates from the Bank of Portugal for the 1990s indicate that the proportion of government debt held by non–resident holders remained low until the mid 1990s (when the inflation adjustment matters most): 10% in 1990, 17% in 1996. Since then, the proportion has increased steadily, reaching 47% in 2001.

[9]For a recent exploration of the minefields associated with the construction of economically meaningful series for household saving in the United States, see Gale and Sabelhaus [1999].

[10]Estimates from the Bank of Portugal for the 1990s indicate that at least 80% of

implicitly assumes that public debt is held (directly, or indirectly through intermediaries with nominal liabilities) by households rather than corporations. Again, in the absence of relevant data, there is little choice than to make that assumption. Finally, we make no further adjustment to adjust for other nominal liabilities.

Figure 7 and the numbers in Table 1 suggest four conclusions:

- The increase in the current account dates back to the late 1980s, but has accelerated in the second half of the 1990s. Using 1985-1991 as the base period, the current account deficit has increased by 10.6% of GDP.

- The increase in the current account deficit is due for less than one third to an increase in investment. The ratio of investment to GDP has increased by 2.8 percentage points relative to 1985-1991. The increase is much larger if we compare the ratio to its value in the early 1990s (an increase of 5.3%), but much of that increase is cyclical, reflecting the period of low growth of the early 1990s.

- The increase in the current account deficit is due for more than two thirds to a decrease in saving. The ratio of saving to GDP has decreased by about 7.8% of GDP relative to its 1985-1991 value.

- The decrease in saving reflects primarily a decrease in private saving. Public saving has decreased by 2.2% of GDP, relative to 1985-1991; private saving has decreased by 5.6%. (Inflation accounting is important here. Absent the inflation correction, public saving would show a rise of 3.1% and the shift in private saving would look much larger, −10.1%)

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the government debt held domestically was held either by households or by financial institutions with nominal liabilities on the liability side.

- The decrease in private saving reflects primarily a decrease in household saving. The ratio of household saving has decreased by 3.8%, the ratio of corporate saving by 1.8% (absent inflation correction, household saving would show a decrease of 8.3%.)

We now look at some aspects of the story behind these numbers.

Take the decrease in **household saving** first. From 1995 to the end of 2001, household debt has increased from 40% to 93% of GDP. Most of this increase has taken the form of either mortgages or consumer loans from banks. At the end of 2001, mortgages represented 39% of total bank loans to the non-financial private sector, and 76% of total loans to households.

Why has there been such an increase in household debt? We could not find substantive changes in the types of mortgages or loans offered by banks. The decrease in interest rates must be a central part of the story: Short–term nominal interest rates have decreased very much, from 16% in 1992, to around 4% in 2001 (for the Euro area as a whole, the numbers are 11% and 4%). Short term real interest rates (measured as nominal interest rates minus realized inflation, using the GDP deflator) have decreased from 6% in 1992 to roughly zero in 2001 (this is more than for the Euro area as a whole, where the rate has decreased 7% to around 3%; due in part to the Balassa–Samuelson effect, inflation is higher in Portugal than the average for the Euro area).

Why the low interest rates? Apart from the decline due to factors common to the OECD, much of it is clearly traceable to financial integration, and the reduction of country risk due to membership in the EMU first, then adoption of the Euro. The single currency has reduced country risk by lowering the probability that Portugal might face a liquidity crisis and thus be forced to stop servicing its external debt. Looking at the balance sheets of banks shows that Portuguese banks have financed this increased credit mostly by borrowing abroad. Given the small size of the Portuguese econ-

omy, participation in the Euro has offered domestic banks easier access to interbank loans from banks in other Euro-area countries. The main instrument for raising funds abroad has been the issuance of international bonds through subsidiaries of Portuguese banks having their head office abroad: the yearly flow of new international bond issues through these subsidiaries increased from one half of 1 million euro in 1998 to 5 billion in 2000. The maturity of these bonds (whose legal status is generally that of "subordinated debt") is between 3 and 5 years, and the currency of denomination is the euro.

Looking at the capital account makes clear that foreign borrowing by domestic banks has indeed played a central role in the way Portugal has financed its current account deficit. Looking at stocks, the net foreign debt position of Portuguese banks has increased from 9 billion euro in 1999 to 24 billion in 2001. Looking at flows, in 2000, the increase in gross indebtedness of resident Portuguese banks was equal to 17.4% of GDP, the increase in net indebtedness was equal to 10.7%—so larger than the current account deficit in that year (we are not singling out banks arbitrarily here: all other gross portfolio and investment flows are small in comparison.)

Turn now to **investment**

Given the growth in mortgage loans, one would have expected the increase in investment to reflect disproportionately an increase in housing investment. Curiously, this is not the case. For most of the 1990s, housing prices have increased at a rate only slightly higher than inflation. And residential investment has remained a nearly constant fraction of total fixed investment, 21-23%. We have no explanation for that fact.

Another apparently puzzling development, in view of the theory sketched in Section 1, is the poor performance of foreign direct investment. Net FDI, which had been an important source of capital inflows following Portugal's entry into the EU in 1985, turned negative in 1995 and has remained negative

since then. Here, looking at gross flows helps solve the puzzle:

- Negative net FDI since 1995 is the outcome of a rapid increase in both inflows and outflows, but more so in outflows than inflows:

- In the late 1980s, following EU accession, FDI into Portugal had increased rapidly, reaching 4% of GDP in 1990. But then, the inflows slowed down, coming to a near standstill in 1995. Since 1995, the inflows have increased again. In 2000, they stood at twice their 1990 level (in dollars), the previous peak.

- Outflows, however, which had been roughly unaffected by EU accession, have increased even faster, reaching, in 2000, 5% of GDP. Most of Portuguese direct investment abroad takes the form of acquisitions, and much of it, 40% of all outflows, goes to Brazil—direct investment in other EU countries is only 15% of all outflows.

  Our interpretation of this fact is that it is, somewhat paradoxically, the result of financial integration within the Euro area, and of the role information plays in direct investment flows. Our guess, based on the large volume of issues of Euro bonds by Portuguese firms, is that European direct investment in a country such as Brazil is carried out mainly through Portugal, which presumably has a comparative advantage in understanding business in that country. This comparative advantage is not new. What is new, following the Euro, is the ability of Portuguese firms to raise funds in a Euro-wide capital market to finance their foreign acquisitions.

We see the image that comes out of our description of Portuguese evolutions as consistent with that from panel data regressions. It is one in which integration, especially financial integration (and integration rather than domestic financial liberalization) has led to lower saving, and to a lesser extent to higher investment, both leading to larger current account deficits.

There is however an alternative view of the current account deficit in Portugal, one based on loss of competitiveness and overvaluation. It points to the decline in exports, due to their unfavorable specialization: In 1995, one fourth of total exports were accounted for by clothing and footwear, some of the products most exposed to competition from developing countries. It suggests that the rate at which Portugal joined the Euro, together with nominal rigidities, led to an overvalued exchange rate, and in turn a current account deficit.

Separating out the role of overvaluation and the mechanisms we have focused on in this paper is far from obvious, both conceptually and empirically. But we see the overall evidence in favor of overvaluation as weak. First, looking at it from the trade balance side, most of the current account deficit is the reflection of an unusually high growth rate of imports, rather than an unusually low growth rate of exports. Second, one would expect overvaluation, and so a low demand for domestic goods, to be associated with unusually low GDP growth; this has not been the case. Third, the index of Portuguese unit labor costs, relative to 22 industrial countries (as computed by the EU, European Economy, Spring 2002, 1991=100), was 109.4 in 1995, 103.8 in 1998, and is 108 in 2002. (The U.S. index from the same source, a useful comparison, increased in those years from 100 to 130). This suggests that overvaluation is at most a minor factor in explaining Portuguese current account deficits.

3.2 Greece

Figure 8 shows the evolution of Greek investment and saving, as ratios to GDP, from 1981 to 2001. It shows that the divergence between investment and saving is more recent than in Portugal, dating back only to the mid 1990s.

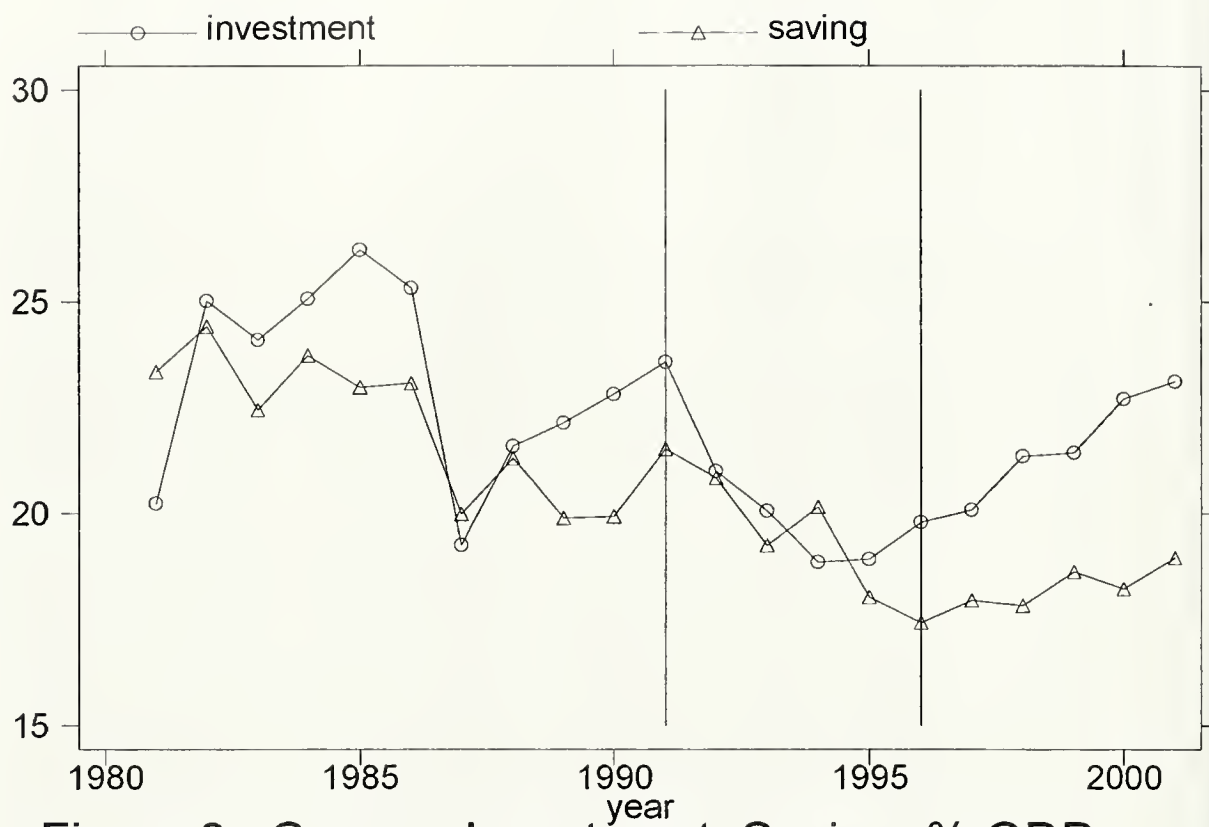Table 2 presents the basic numbers. One must again be careful about the

Figure 8. Greece: Investment, Saving. % GDP

choice of a base period. Just as Portugal, Greece went through a recession in the mid–1990s, and using that period as the base would be misleading. Thus, in presenting numbers, we divide time in three periods: 1981–1991 (1991 is the last year of sustained growth), with an average growth rate of 2.5%; 1992–1995, a period of slow growth, with an average growth rate of 0.8%, and 1996–2001, a period of sustained growth, with an average growth rate of 3.5%. To show recent evolutions, we also present numbers for 2000 and 2001. When reporting changes, we compare the numbers for 2000–2001 for those for 1981–1991.

Greece is one of the countries for which the numbers reported by the EU and by the OECD differ the most. There are basically two time series for the Greek current account balance. One is the series reported by the Bank of Greece, and used by the OECD, and is based on information on international transactions collected by commercial banks. The other, used in the national accounts and by the EU, is derived from customs information. Both sources have become less reliable over time: the first because the removal of currency restrictions has reduced the information available to commercial banks; the latter because of the gradual elimination of custom controls on intra–EU trade. We report the two sets of numbers in the first two lines of Table 2, but, for consistency with the numbers for the other variables, base the rest of our analysis (and Figure 8) on the EU numbers. While the levels of the deficit according to the two sources are very different, the change in the deficit is essentially the same: a wider current account deficit of around 3% of GDP (3.5% according to the EU, 2.5% according to the OECD.)

The numbers in the table are adjusted for inflation in the same way as for Portugal.[11] Again, the adjustment matters a lot: The inflation rate has

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[11]Estimates from the Bank of Greece indicate that, until the mid–1990s, the proportion of government debt held by non–resident holders was low. It has recently increased, from 20% of total debt in 1997, to 45% in 2001.

decreased from 18% for 1981–1991, to 12.5% for 1992–1995, and 5% since 1996 (it stands around 3% today); Gross public debt increased from 50% in 1985 to 100% of GDP in 1992, and it has remained above 100% since.

Table 2. Current Account Balance, Investment, and Saving, as ratios to GDP, percent. Greece 1981-2001

	1981-91	1992-95	1996-2001	2000-01	Δ
Current account (EU-Nat Def)	-0.9	-0.2	-3.3	-4.4	**-3.5**
Current account (OECD-BoG)	-4.0	-1.4	-4.6	-6.5	**-2.5**
Investment	22.9	19.7	21.3	23.0	**0.1**
Saving	22.0	19.5	18.2	18.6	**-3.4**
of which					
Public saving	1.4	2.2	3.8	5.3	**4.3**
Private saving	21.0	17.3	14.4	13.3	**-7.7**
of which					
	1995	1997	2000		
Household saving	6.8	7.6	6.7		
Corporate saving	10.7	7.0	6.4		

Δ *: Difference between 2001–2000 and 1981–1991. Sources. European Commission, Statistical Annex of "European Economy", spring 2002. The breakdown of private saving between household and corporate saving was given to us by the Bank of Greece.*

Figure 8 and the numbers in Table 2 suggest four conclusions:

- The increase in the current account deficit does not reflect an increase in investment. The ratio of investment in 2000–2001 is the same as in the base period, 1981–1991. The proposition that entry into the EMU,

and later the Euro area, was accompanied by an investment boom is only the result of an inappropriate comparison with the recession of the early 1990s and the sharp fall in capital formation that happened then.

- By implication, all the increase in the current account deficit can be traced to a decrease in saving. The current account deficit has increased by 3.5%. Saving has decreased by 3.4%

- The decrease in saving is more than fully accounted for by an even larger decrease in private saving. Private saving has decreased by 7.7%, while public saving has increased by 4.3%. This is very different from Portugal. There, as we saw in Table 1, both private and public saving have decreased. In Greece the swing in (inflation adjusted) private saving has been twice as large as in Portugal but has been partly offset by the increase in (inflation adjusted) public saving.

- The decomposition between corporate and household saving can only be made from 1995 on. Based on this information, it appears that much of the decrease in private saving comes from a decrease in retained earnings, rather than a decrease in household saving. (again, the inflation correction is important here, as the inflation decreased from 9% in 1995 to about 3% in 2000, and the debt–to–GDP ratio remained around 100%. Absent the inflation correction, the ratio of household saving to GDP shows a decline of about 6% from 1995 to 2000).

We now look at some aspects of the story behind these numbers.

There has indeed been a clear shift of firms from internal finance to share issues. The flow of capital raised in the stock market went from zero in 1995-1996 to 8% in 2001. A plausible explanation is the stock market boom, that lasted from early 1998 to the end of 1999.

One might have expected the decrease in retained earnings to lead to an increase in household saving (although this may be assuming too much rationality on the part of stockholders). There was no such increase. Household saving has remained flat since 1995. The volume of consumer loans, which was equal to 1.6% of GDP in 1995, is now equal to 6%. The volume of mortgage loans, which was equal to 4.5% is now equal to 12%. It is clear that domestic financial liberalization is playing an important role here: Consumer loans were virtually prohibited until 1997. Financial integration in turn has allowed this decrease in saving to show up as an increase in the current account deficit, rather than a decrease in investment.[12]

In contrast to Portugal, net FDI flows have remained positive, but small. But, as in Portugal, small net flows hide a more complex reality. They are the result of Greek direct investment in the Balkan region and in the Mediterranean (over one third of total Greek FDI), compensated by direct investment in Greece coming from the rest of the EU. (Even gross flows however are not very large, around 3% of GDP).

Finally, as in the case of Portugal, there is little evidence that the increase in the Greek current account deficit is primarily the result of a lack of competitiveness, possibly arising from a "too strong" entry rate into the Euro. The index of Greek unit labor costs, relative to 22 industrial countries (European Economy, Spring 2002, 1991=100), was 112 in 1995, 119 in 1999 and is 111 in 2002.

Let us summarize what we have learned from this section.

The story for both Portugal and Greece is generally consistent with the general theme of section 1, and the panel data evidence of section 2.

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[12]Isaac Sabethai has suggested an alternative explanation for the decrease in saving: With the increasing integration of Greece in the EU has come an attempt of Greek consumers to catch up with EU consumption standards.

Financial integration and financial liberalization have made it easier to borrow, and easier to borrow abroad. The move to the Euro appears important. The elimination of exchange rate risk associated with the Euro is leading to additional borrowing in Euros by Portuguese banks for Portugal, to the purchases of Greek government bonds by foreign investors—one of the largest items in the financing of the Greek current account deficit.

The effect on investment has been surprisingly limited. (The effect of entry in the EU had much larger effects on Portugal earlier). This suggests that it takes more than integration to increase capital flows, a conclusion often reached about FDI flows in particular. FDI movements are interesting, with increased gross flows and geographic specialization, but modest net flows.

The effect appears to be mostly through saving. Here, it is tempting, despite the obvious warnings about the interaction between public and private saving, to link some of the differences across countries to differences in public saving. One of the reasons why Greece has a smaller current account deficit than Portugal may be related to the fact that Greece went through a substantial fiscal consolidation, not Portugal.

In this context, it is interesting to note what happened in Ireland. Like Portugal and Greece, Ireland was once one of the poor countries of the European Union; PPP GDP per capita in 1987 was about 70% of the EU average. Thanks to high growth since the late 1980s, it has more than fully caught up, and now has a level of GDP per capita 20% higher than the EU average.[13] Yet, during most of that period, it has run a current account surplus, not a current account deficit. Why is this? The proximate cause is a large increase in saving: From 1987 to 2000, the ratio of saving to GDP increased from 16.2% to 24.1%, roughly in line with the increase in the ratio of investment to GDP. And the proximate cause of this increase in saving

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[13]For an analysis of the "Irish miracle", see Honohan and Walsh [2002].

is a large increase in public saving: From 1987 to 2000, the government's primary balance has shifted from a deficit of 3.4% of GDP to a surplus of 5.5%. Taking one more step back, it is clear that this increase in public saving has been in turn the result of high growth—and so high potential revenue growth— and fiscal consolidation. This suggests that the difference between Ireland and the two countries we have examined comes in part from the evolution of public saving, itself due in part to higher GDP growth.

4   Extensions and Conclusions

4.1   Back to the Feldstein–Horioka puzzle

Our findings are obviously closely related to the research triggered by the "Feldstein–Horioka puzzle," the high correlation between investment and saving rates, both across time and across countries. The findings of an increasing positive dependence of saving on income per capita and a negative dependence of investment on income per capita raise the possibility that this correlation has decreased through time.[14]

With this in mind, we explore the relation between investment and saving across countries and time. We do so by running two sets of regressions.

First, we run conventional Feldstein–Horioka regressions of investment

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[14]The large literature triggered by the original paper (Feldstein and Horioka [1980]) has pointed out that the high correlation is not necessarily a puzzle (see for example the discussion in Obstfeld and Rogoff [1996]). Even in a fully integrated economy—an economy in which investment decisions do not depend on domestic saving—some shocks will move saving and investment in the same direction, generating a positive correlation between the two. If these shocks dominate, the correlation will be high. Our purpose here is to document what has happened to this correlation over time, and relate it to our findings, not to take a stand on whether there is or there is not a puzzle.

on saving, over different time periods:

$$(I/Y)_{it} = a + b\ (S/Y)_{it} + \epsilon_{it}$$

where $(I/Y)_{it}$ and $(S/Y)_{it}$ are ratios of investment and saving to GDP in country i and year t. Table 3 shows the estimated values for b, first from estimation over the whole period 1975–2001, then over two subperiods, 1975–1990 and 1991–2001, for each of the four groups of countries listed earlier (plus, for comparison with other studies, the group of all OECD countries; that panel however is not a balanced panel, as observations for Central European countries are missing pre–1990).

Table 3. Feldstein–Horioka coefficients, 1975-2001 and subperiods

	OECD	OECD minus	EU	Euro	Euro minus
1975–2001	0.58	0.51	0.47	0.35	0.39
1975–1990	0.56	0.55	0.50	0.41	0.49
1991–2001	0.57	0.38	0.36	0.14	0.26

Table 3 suggests two main conclusions:

- The coefficient of the original Feldstein–Horioka regression, run on a sample of 16 OECD countries over the period 1960–1974, was 0.89. When Obstfeld and Rogoff [1996] ran the same regression on a sample of 22 OECD countries over the period 1982–1991, they found a coefficient of 0.62. Our results, for the OECD as a whole, give a coefficient of 0.58, with no evidence of a decline in the coefficient over time.

- As we move from the OECD to the EU and to the Euro area, the coefficient steadily declines, suggesting steadily higher degrees of inte-

gration. It also declines over time, to reach much lower values in the 1990s. The coefficient for the Euro area, for 1991-2001, is only 0.14.[15]

To look at the evolution of the relation between investment and saving more closely, we then run the following regression:

$$(I/Y)_{it} = a_t + b_t \, (S/Y)_{it} + \epsilon_{it}$$

That is, we allow for both year effects and year–specific coefficients on saving. Figure 9 plots the time series for estimated b_t, for the four groups of countries we have defined earlier, plus the OECD as a whole. The five panels confirm and amplify the results from Table 3:

- The coefficient for the OECD as a whole does not show much of a decline in b_t over time, except in the second half of the 1990s, with a partial reversal in 2001.

- The coefficient for OECD minus shows more of a steady decline over the 1990s. The coefficient at the end of the period is close to zero.

- The coefficients for the EU and the Euro area show an inverse U shape, with the coefficient initially increasing from a value close to zero in 1975 to a higher value, and then steadily declining from the late 1980s

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[15]Part of this decrease may reflect not integration, but a side effect of integration, namely the adoption of similar national income accounts, such as the ESA 1995 norms for the EU. Suppose for example that, before adoption, one country had high measured investment and saving, the other country low measured investment and saving. The cross country correlation between investment and saving across countries was high. If however this high correlation reflected different definitions of saving and investment, adoption of common accounting rules will make levels more similar, and decrease the cross country correlation.
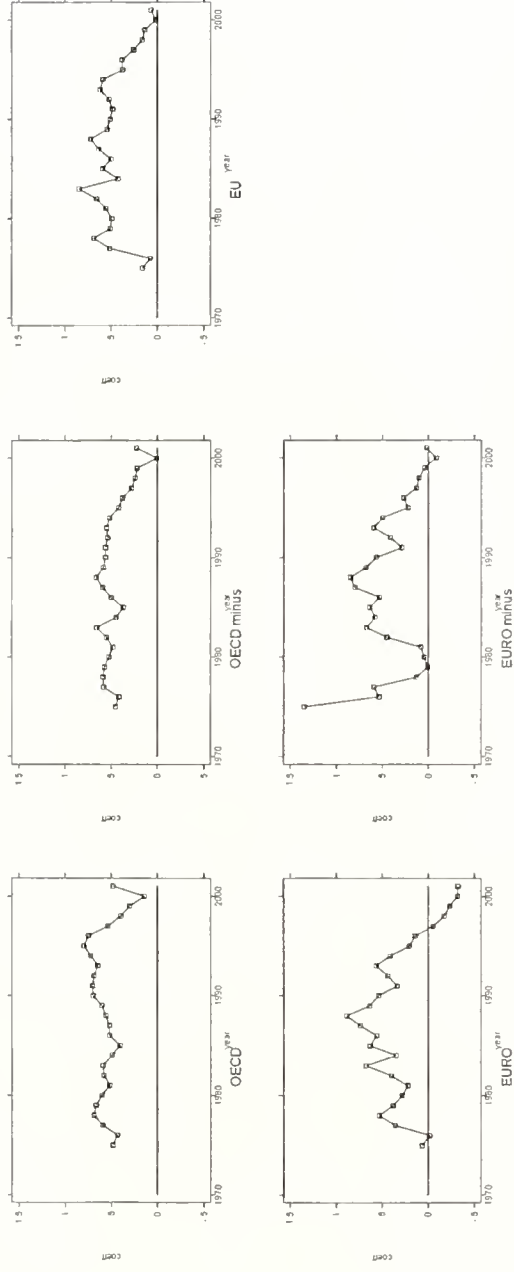
Figure 9. Estimated Feldstein Horioka coefficients, 1975-2000

on. The last panel, which shows the coefficient for Euro minus, does not exhibit the low value of the coefficient at the start, and so indicates that the low initial value in the other panels comes again from the experience of Portugal and Ireland in the late 1970s and early 1980s.

• For the EU and the Euro area, the estimated coefficient is close to zero or negative at the end of the 1990s. Our earlier results suggest a natural interpretation. To the extent that investment and saving depend with opposite signs on income per capita, and to the extent that integration reinforces these two effects, the estimated coefficient in a regression of investment and saving may well be negative, and this may be what we are observing at the end of the period.

In short, for the countries of the European Union, and even more so for the countries of the Euro area, there no longer appears to be a Feldstein–Horioka puzzle. In highly integrated regions, investment and saving appear increasingly uncorrelated.

4.2 Is benign neglect the optimal policy response?

So far, the attitude of both the European Commission and the European Central Bank vis a vis the Portuguese and Greek current account deficits has been one of benign neglect. That attitude is the same as that prevailing in the United States vis a vis state deficits. Current account deficits of individual states are not even recorded, much less worried about.[16] Is the same attitude justified for the countries of the Euro area?

Let us briefly review what theory tells us:

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[16] This is what made the study of Puerto Rico by Ingram we discussed earlier so interesting. For some time after integration, Puerto Rico continued to collect the statistical information needed to measure the evolution of its current and capital accounts.

- If these current account deficits had their origin in large fiscal deficits, then issues of intergenerational distribution would obviously arise. Higher government debt would mean higher taxes in the future, and thus a higher burden on future generations. But, in this case, the issue is moot: As we have seen, the current account deficits have their origin in private saving and private investment. The consumers who are taking mortgages in Portugal are the ones who will have to repay them, not future generations. They may be too optimistic about future income prospects, but we do not typically think of this as a reason for macro policy intervention.

- Even so, ever since the work of Diamond [1965] on overlapping generation economics, we know that, in a closed economy, individual saving decisions may be privately optimal, but still lead either to an inefficient aggregate outcome (in the case of dynamic inefficiency), or to one with unappealing implications in terms of intergenerational distribution: If current consumers save little, the capital stock will be smaller, and so will be the income of future generations. Thus, in a closed economy, low private saving may well justify government intervention on behalf of future generations, for example in the form of higher public saving for example.

- This last argument becomes weaker however when the economy is open (see Buiter [1981] for an analysis of the overlapping generation model in an open economy). Consider for example the limiting case in which the economy is open, fully integrated in world financial markets, and the elasticity of demand for domestic goods is infinite—so we are, in effect in a "one–good" world. Then, the issue of generational redistribution becomes irrelevant. Saving decisions in the country have no effect on investment in the country, and thus have no effect on future output, no effect on the income of future generations. The very integration which

leads to larger current account deficits also reduces their generational distribution implications.

- This limiting case is too strong however. Even Euro area countries are short of being fully integrated, and surely face downward sloping demand for their goods. And so, to the extent that large current account deficits today lead to the need for trade surpluses in the future, they also lead to the need for low relative prices for domestic goods in the future, and so to lower income (in terms of consumption) for future generations. In this case, the legacy of high current account deficits is not low capital, but their adverse effect on future terms of trade. This provides an argument for higher public saving today; but the argument seems empirically weaker than the standard closed economy capital accumulation argument.

Another line of arguments relies on the presence of other imperfections. The most obvious one, in the case of the Euro area, is the presence of nominal rigidities. Indeed, one of the standard problems in common currency areas is that of adjustment of relative prices across countries. Granted the presence of nominal rigidities, the question is what implications this has in this case. Let's again review the basic theory:

- Under flexible prices, the increase in the current account deficit comes with a real appreciation, an increase in the relative price of domestic goods. Later on, when time comes to repay or service the increased debt, the need to generate a trade surplus requires a real depreciation.

- If prices are rigid (or at least do not fully adjust), and output is determined by demand, the initial real appreciation will be less than would take place under flexible prices. The shifts in saving and investment we discussed in Section 1 will then be lead to both an increase in output above its natural level, and a smaller current account deficit than

would be the case under flexible prices.

- How nominal rigidities affect what happens in the future depends on the exact nature of these rigidities:

  If prices do not fully adjust in the future when time comes to repay or service the debt (a more doubtful proposition than the one in the previous bullet point, as this is both a slow and very predictable event), then the attempt of consumers and firms to repay or service the additional debt will, in the future, lead to a decrease in output below its natural level—to a recession—and, through that mechanism, to the trade surplus needed to repay or service the debt.

  To the extent that future prices can adjust, the trade surplus will be generated through a depreciation rather than a decrease in output. To the extent that repayment takes place gradually (as opposed to the rapid repayment required in currency crises), this case strikes us as a more reasonable working hypothesis.

Now turn to implications for fiscal policy (The Greek or Portuguese governments obviously have no control over monetary policy, and because of the symmetry between current account surpluses and deficits across countries in the Euro area, the ECB has no reason to respond by changing monetary policy)

- If the governments of Portugal and Greece do not change their fiscal stance, the shifts in saving and investment in response to integration will lead to output in excess of its natural level. This in turn will lead to higher inflation than in the rest of the Euro area, and thus eventually generates the required appreciation.

- If those governments decide instead to maintain output at its natural level. say through higher public saving, they will, by implication.

reduce the current account deficit. Under the assumption that the marginal propensity to import is the same for all types of spending (consumption, investment, government), the use of fiscal policy to maintain output at its natural level will implies eliminating the current account deficit altogether.

- Only a formal quantitative model can tell us exactly what fiscal policy should be in this case. But it is surely not to fully offset the increase in private spending so as to maintain output at its natural level. This would have the implication of largely or fully eliminating the current account deficit, thus losing one of the main benefits of economic integration, namely the ability to intertemporally reallocate consumption and investment. So, while benign neglect may not be optimal, it appears, at least for those deficits, to be a reasonable course of action.

Should Euro area members follow the example of U.S. states and stop collecting current account statistics ? There are at least three reasons for caution. The fact that European product markets are not yet fully integrated implies the changes in relative prices required to service or repay the debt remain larger than in the U.S.: For this reason, policy makers will want to know how much foreign debt a country is cumulating. Second, the potential output costs of adjusting relative prices—through a recession reducing the inflation rate below the EU inflation rate—is another reason to worry about the level of foreign debt. Finally, Euro fiscal rules may prove weaker than those that stop U.S. states from running large budget deficits: In such a situation, knowing what the effect of the budget deficit is on the current account would certainly be valuable.

References

Barro, R. J. and Sala-i-Martin, X., 1992, Convergence, *Journal of Political Economy* **100(2)**, 223–251.

Buiter, W., 1981, Time preference and international lending and borrowing in an overlapping generation model, *Journal of Political Economy* **89**, 769–797.

Chinn, M. and Prasad, E., 2000, Medium term determinants of current accounts in industrial and developing countries: An empirical exploration, NBER WP 7581, March, (forthcoming Journal of International Economicss).

Debelle, G. and Faruqee, H., 1996, What determines the current account? A cross sectional and panel approach, IMF working paper 96/58.

Diamond, P., 1965, National debt in a neoclassical growth model, **55**, 1126–1150.

Dornbusch, R., 1983, Real interest rates, home goods, and external borrowing, *Journal of Political Economy* **91-1**, 141–153.

Feldstein, M. and Horioka, C., 1980, Domestic saving and international capital flows, *Economic Journal* **90**, 314–329.

Fischer, S. and Frenkel, J., 1974, Economic growth and the stages of the balance of payments, pp. 503-521, in "Trade, Stability and Macroeconomics", G. Horwich and P. Samuelson, eds, Academic Press, New York.

Gale, W. and Sabelhaus, J., 1999, Perspectives on the household saving rate, *Brookings Papers on Economic Activity* 1, 181–214.

Gourinchas, P.-O. and Jeanne, O., 2002, On the benefits of capital account integration for emerging economies, mimeo, Princeton University and IMF.

Honohan, P. and Walsh, B., 2002, Catching up with the leaders; The Irish hare, *Brookings Papers on Economic Activity* **(1)**, 1–57.

Ingram, J., 1962, *Regional Payment Mechanism: The case of Puerto Rico*, University of North Carolina Press, Chapel Hill.

Ingram, J., 1973, *The case for European monetary integration*, Essays in International Finance, no 98, Princeton University, International Finance Section.

King, R. and Levine, R., 1993, Finance and growth: Schumpeter might be right, *Quartely Journal of Economics* **108(3)**, 717–738.

Lane, P. and Milesi-Ferretti, G., 2001a, The external wealth of nations., *Journal of International Economics* **55**, 263–294.

Lane, P. and Milesi-Ferretti, G., 2001b, Long term capital movements, *NBER Macroeconomics Annual* pp. 73–115.

McKinsey Global Institute, 2002, *Reaching high productivity growth in France and Germany*, McKinsey, forthcoming.

Obstfeld, M. and Rogoff, K., 1996, *Foundations of international macroeconomics*, MIT Press.

Ventura, J., 2002, Towards a theory of current accounts, mimeo, MIT.